

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
AIR PERMITS PROGRAM**

**TECHNICAL ANALYSIS REPORT**  
for  
Air Quality Control Minor Permit AQ0209MSS01

Alaska Light and Electric Power Company  
Lemon Creek Generating Station

**REVISE PSD AVOIDANCE FORMULA FOR UNITS 6 THROUGH 12**

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## ABBREVIATIONS/ACRONYMS

AAC.....	Alaska Administrative Code
ACMP.....	Alaska Coastal Management Program
ADEC.....	Alaska Department of Environmental Conservation
AS.....	Alaska Statutes
ASTM.....	American Society of Testing and Materials
BAE.....	Baseline Actual Emissions
CEMS.....	Continuous Emission Monitoring System
C.F.R.....	Code of Federal Regulations
EPA.....	Environmental Protection Agency
MACT.....	Maximum Achievable Control Technology
NA.....	Not Applicable
NAICS.....	North American Industry Classification System
NESHAPS.....	National Emission Standards for Hazardous Air Pollutants
NSPS.....	New Source Performance Standards
ORL.....	Owner Requested Limit
PAE.....	Projected Actual Emissions
PS.....	Performance Specification
PSD.....	Prevention of Significant Deterioration
PTE.....	Potential to Emit
RM.....	Reference Method
SIC.....	Standard Industrial Classification
SN.....	Serial Number
TBD.....	To Be Determined

### Units and Measures

bhp.....	brake horsepower or boiler horsepower
gr./dscf.....	grains per dry standard cubic feet (1 pound = 7,000 grains)
dscf.....	dry standard cubic foot
gph.....	gallons per hour
kW.....	kiloWatts
kW-e.....	kiloWatts electric <sup>1</sup>
lbs.....	pounds
mmBtu.....	million British thermal units
ppm.....	parts per million
ppmv.....	parts per million by volume
tph.....	tons per hour
tpy.....	tons per year
wt%.....	weight percent

### Pollutants

CO.....	Carbon Monoxide
HAPS.....	Hazardous Air Pollutants
H <sub>2</sub> S.....	Hydrogen Sulfide
NO <sub>x</sub> .....	Oxides of Nitrogen
NO <sub>2</sub> .....	Nitrogen Dioxide
NO.....	Nitric Oxide
PM-10.....	Particulate Matter with an aerodynamic diameter less than 10 microns
SO <sub>2</sub> .....	Sulfur Dioxide
VOC.....	Volatile Organic Compound

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<sup>1</sup> kW-e refers to rated generator electrical output rather than engine output

## 1.0 Introduction

This Technical Analysis Report (TAR) provides Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Source Air Quality Control Permit AQ0209MSS01 to Alaska Electric Light and Power Company (AEL&P) for the Lemon Creek Generating Station under 18 AAC 50.508(6). The minor permit application is dated March 10, 2009. In the minor permit, the Department establishes a new formula used to limit the MW-hrs for Units 7 through 12 in place of the nitrogen oxide (NO<sub>x</sub>) emissions limit to avoid Prevention of Significant Deterioration (PSD) review. This formula replaces the original fuel consumption Owner Requested Limits (ORL) established in the Permit to Operate 9311-AA001. By request of AEL&P, the Department intends to administratively amend the Title V permit under the provisions of 18 AAC 50.326(c) (2) after EPA approval.

### 1.1 Stationary Source Description

The Lemon Creek Standby Generating Station is classified as a Prevention of Significant Deterioration (PSD) Major source as defined in 18 AAC 50.306 because it has the potential to emit more than 250 TPY of a regulated air pollutant in an area classified as attainment or unclassifiable. However, the Lemon Creek Standby Generation Station has never undergone a PSD review because the stationary source was in full operation before 1977, and was never modified after August 8, 1980, to exceed the PSD trigger levels. Through owner requested limits (ORLs) established in Permit to Operate 9311-AA001, the Lemon Creek Standby Generation Station avoided PSD review in 1993.

The Department issued the initial Title V Operating Permit AQ0209TVP01 on June 21, 2000 that incorporated all stationary source-specific requirements in Permit-to-Operate 9311-AA001. This permit expired in June 2005. The Department issued an operating permit renewal (Permit AQ0209TVP02) on April 18, 2005. AEL&P is now operating under permit AQ0209TVP02.

### 1.2 Application Description

AEL&P requests that the Department revise Operating Permit AQ0209TVP02, condition 7.2 as follows:

Limit Unit ID 6 plus ~~4.29~~ **4.93** times the total MW-hrs from Unit IDs 7 through 12 to no more than 21,000 MW-hrs in any 12 consecutive month.

Condition 7.5(g) of the Title V permit requires AEL&P to conduct source emission testing to check compliance with Condition 7.2 for NO<sub>x</sub> emissions, and to revise the Title V permit if the source tested emission factor is greater than 0.0339 lb/MW-hr (the emission factor originally used to develop the PSD avoidance condition). AEL&P submitted the application under 18 AAC 50.508(6) as a change to Title I provision.

### 1.3 Department Findings

Based on the review of the application, the Department finds that:

1. The AEL&P Lemon Creek plant is a PSD major stationary source because the existing PTE exceeds 250 tpy for a regulated pollutant.

2. The stationary source is operating under Permit AQ0209TVP02, which includes original Permit to Operate 9311-AA001 conditions.
3. The Department made an error in Condition 7.5(g) of the Operating Permit AQ0209TVP02 by stating that an administrative revision to the Title V permit can be made if source test reveal higher emission rates. This type of revision is a substantive change to the permit and does not qualify for an administrative revision to the Title V permit. A minor permit under 18 AAC 50.508(6) is required to revise underlying basis for this provision.
4. When carrying the Title I provisions listed in Permit-to-Operate 9311-AA001 into the initial Title V permit, the Department inappropriately revised the fuel consumption limits for Units 5 and Units 6 through 12 to MW-hr limits, without going through a Title I permit process. As such the Department is establishing the MW-hr limits for Unit 5 and Units 6 through 12 in this permit action (in addition to revising the MW-hr limit for Units 6 through 12 under 18 AAC 50.508(6)).
5. This revision is a Clean Air Act 502(b) (10) Operational Flexibility change. It does not affect the monitoring, recordkeeping, reporting, or compliance certification requirements and thus does not require a Title V revision. AEL&P may operate under AQ0209MSS01 upon issuance.
6. AEL&P has requested the Department incorporate the revised Condition 7.2 into the current Title V permit AQ0209TVP02. The Department intends to administratively amend the Title V permit under the provisions of 18 AAC 50.326(c) (2) after EPA approval.
7. AEL&P's Lemon Creek Generating Station is located in the City and Borough of Juneau in the Southeast region. The Lemon Creek Generating Station was previously found consistent with the Alaska Coastal Management Program (ACMP) through AS 46.40.040(b) (1). The proposed modification is within the scope of the original project that was reviewed under 11 AAC 110.820(k) (4) and is not subject to further consistency review because ACMP regulations specify that they have no additional effect on coastal uses and resources.
8. On their *Stationary Source Identification Form*, AEL&P requested that the Department process the application using the Fast-Track procedures in 18 AAC 50.542(b). The Fast-Track option is not available for applications classified under 18 AAC 50.508(6), so the Department is processing the application using the public comment procedures in 18 AAC 50.542(d).

## 2.0 Permit Requirements

### 2.1 Requirements for all Minor Permits

As described in 18 AAC 50.544(a), this minor permit identifies the stationary source, the project, the Permittee, and contact information.

Although the permit is required under 18 AAC 50.544(a) to contain the fee requirements of 18 AAC 50.400 – 18 AAC 50.499, this permit action does not contain any changes to the

assessable emissions listed in the Operating Permit AQ0209TVP02. Therefore, no fee requirement is listed in the permit.

## **2.2 Requirements for a Minor Permit that Revises or Rescinds a Previous Title I Permit**

As required in 18 AAC 50.544(i), this minor permit contains terms and conditions as necessary to ensure that the Permittee will construct and operate the stationary source in accordance with 18 AAC 50.

### **2.2.1 Ambient Air Quality Analysis**

AEL&P has previously demonstrated that the Lemon Creek Generating Station complies with the Ambient Air Quality Standards listed in 18 AAC 50.010 for all pollutants. Since AEL&P is not proposing any emissions increase as part of this permit action, no additional ambient demonstrations are needed.

### **2.2.2 Title I Permit Conditions Revisions**

In this minor permit, the Department has revised the PSD avoidance limit for Units 6 through 12 to reflect new source test data for a source test conducted on August 21, 2008. The new emission factor was 0.039 lb/kW-hr, compared to 0.0339 lb/kW-hr used to develop the PSD avoidance condition. The original formula used a multiplier of 4.29 to represent the difference in emissions between the turbine (Unit 6) and diesel generators (Units 7-12). The emission factor for diesels and turbines were 0.0339 and 0.0079 lb NO<sub>x</sub> /kW-hr, respectively. Since the diesel's (Units 7-12) emission factor was 4.29 times that for the turbine (Unit 6), the MW-hr from Unit 7-12 had the 4.29 multiplier, since emission rate is directly dependent on MW-hr. Recent testing showed an increase of emissions from the diesel engines (Units 7-12) but the same emission factor for the turbine (Unit 6). To reflect this greater emission rate, AEL&P requested to revise Condition 7.2 with a higher multiplier of 4.92 to keep the 83 tons per 12 month limit.

The revised limit continues to limit Units 6 through 12 to less than 83 tons per 12 months, thereby continues to ensure that PSD is avoided for the 1993 permit action. This minor permit ensures that the Permittee will continue to operate the source in accordance with the chapter as described in this section.

## **2.3 Other Permit Conditions**

The minor permit contains additional requirements as necessary to ensure that the Permittee will construct and operate the stationary source in accordance with 18 AAC 50, as described in 18 AAC 50.544(i). These requirements are listed in the minor permit under "Standard Conditions".

## **3.0 Permit Administration**

Minor Permit AQ0209MSS01 revises a Title I provision.

The Title I revision to Condition 7.2 falls is a Clean Air Act Section 502(b) (10) as defined in 40 CFR 71.2. Under 40 CFR 71.6(a)(13), a permitted source may make section 502(b)(10) changes without requiring a (Title V) permit revision, if the changes are not modifications under any provision of Title I of the Act (it isn't) and the changes do not exceed emission allowed under the permit (they don't). Therefore AEL&P may operate under this Title I revision upon issuance.

Although not necessary in order to operate under the minor permit, AEL&P requested that the Department incorporate the provision into the current operating permit. The Department will incorporate the minor permit provisions into the Title V Operating Permit AQ0209TVP02 as an administrative revision at AEL&Ps request.